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BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

COMMENTS AND RECOMMENDATIONS OF THE MINNESOTA OFFICE OF ENERGY SECURITY ENERGY FACILITY PERMITTING STAFF

DOCKET NO. ET-6657/WS-08-573

Meeting Date: October 1, 2009……..……..Agenda Item # _____

Company: Wisconsin Power and Light Company (WPL)

Docket No. **PUC Docket Number: ET-6657/WS-08-573**

In the Matter of the Application of Wisconsin Power and Light Company for a Site Permit for a 400-Megawatt Large Wind Energy Conversion System and Associated Facilities in Freeborn County.

Issue(s): Should the Commission grant a site permit to Wisconsin Power and Light Company for the 400 MW Bent Tree Wind Project?

OES EFP Staff: Larry B. Hartman.....651-296-5089

Relevant Documents

Site Permit Application for WPL……..August 22, 2008
ALJ Summary of Public Testimony…….August 25, 2009
Hearing Exhibit List……..…August 25, 2009

The enclosed materials are work papers of the Office of Energy Security (OES) Energy Facility Permitting (EFP) Staff. They are intended for use by the Public Utilities Commission and are based on information already in the record unless otherwise noted. This document can be made available in alternative formats; i.e., large print or audio tape by calling (651) 201-2202 (Voice) or 1-800-627-3529 (TTY relay service).

Documents Attached:
1. WPL Bent Tree Project Site Map
2. Wind Schematic
3. Proposed Findings of Fact and Conclusions
4. OES EFP Staff Exhibit List
5. Proposed Site Permit

(Note: see eDockets (08-573) or the PUC Facilities Permitting website for additional documents: http://energyfacilities.puc.state.mn.us/Docket.html?Id=19665.

Statement of the Issue

Should the Commission grant a site permit to Wisconsin Power and Light Company for the 400 MW Bent Tree Wind Project?

Introduction and Background

Wisconsin Power and Light Company (WPL), applied for a site permit to the Commission on August 22, 2008, to develop the proposed 400-Megawatt Bent Tree Wind Project located in Freeborn County. The Project is proposed to be developed in two 200 MW phases. Phase I is scheduled for construction in 2010 with an expected in-service date of December 31, 2010. Plans for Phase II are unknown at this time.

Project Location and Land Control
The proposed Bent Tree Wind Project is located in northwestern Freeborn County, approximately four miles northwest of Albert Lea, as shown on the accompanying map. See Attachment 1 in Commissioner's packet. The Project area includes portions of Hartland, Manchester, Bath and Bancroft townships. The proposed site, approximately 32,500 acres in size, is comprised primarily of agricultural lands (crops and pasture), and scattered woodlots. WPL controlled, at the time of its application, approximately 24,000 acres of land and wind rights within the proposed 32,500 acre Project Area.

WPL has options, leases or easements on the land and wind rights necessary within the site to build the Project. The Phase I portion of the Bent Tree Wind Project contains 294 parcels of land and owners of 195 parcels are Project participants. The Phase II portion of the Bent Tree Wind Project contains 168 parcels of land and owners of 118 parcels are Project participants. In total there are 462 parcels of land in the Project and owners of 313 parcels are Project participants. However, additional wind rights and buffers may need to be obtained to comply with site permit setback requirements. Land and wind rights will need to encompass the proposed wind farm and all associated facilities, including but not limited to wind and buffer easements, wind turbines, access roads, meteorological towers, electrical collection system and electric lines located on or along public road rights-of-way.

Additional land rights will need to be acquired for the 18 mile long 161 kV transmission line.

Site terrain is flat to undulating and has both long and short vistas due to the nature of the topography and landscape features. The Bent Tree Wind Project will temporarily disrupt up to several hundred acres of agricultural lands for roads and turbine components and other associated facilities during the construction phase. It is anticipated that the area of direct land use for the turbines, associated facilities and roads, excluding the substation and operations and maintenance building, will be approximately 180 acres for each phase of the Project.

Bent Tree Wind Project

The Bent Tree Wind Project (Phase I and Phase II) as proposed will use up to 242 Vestas V82 1.65 megawatt wind turbines. The Vestas turbines will be mounted on 80-meter (262 feet) high freestanding tubular steel towers. The blades on the Vestas wind turbines are 41 meters (134 feet) long. The rotor diameter is 82 meters (269 feet). The electrical collector system will consist of underground 34.5 kV collection and feeder lines. The electrical system and feeder lines will be located along public roads when possible.

Other project components include: all-weather class 5 access roads of gravel or similar materials, pad-mounted step-up transformers, concrete and steel tower foundations, an underground supervisory control and data acquisition system, up to two permanent reference meteorological towers, and a project substation (location undetermined within the site). The Project will also include an operations and maintenance building in Hartland. The O&M building will be permitted by the appropriate governmental unit.

Power from the Project substation will be delivered by a 161 kV transmission line approximately 18 miles long to the ITC owned Hayward Substation located on the east side of Albert Lea for delivery to the grid. Freeborn County is responsible for permitting the 161 kV transmission line and Project substation.

Regulatory Process and Procedures

A Certificate of Need (CON) from the Commission is required for this project (Minn. Stat. §216B.243). On August 27, 2008 a Commission Order accepted the Certificate of Need Application from Wisconsin Power and Light for Phase I (approximately 200 Megawatts) of the proposed 400 MW Bent Tree Wind Project. (PUC Docket No. IP-6657/CN-07-1425). In its Order the Commission approved the use of an informal review process and requested that the Office of Administrative Hearings coordinate with Commission staff and hold at least one public hearing on the project.

A site permit from the PUC is required to construct a Large Wind Energy Conversion System (LWECS), which is any combination of wind turbines and associated facilities with the capacity to generate five megawatts or more of electricity (Minnesota Statute Chapter 216F). This requirement became law in 1995. The rules to implement the permitting requirement for LWECS are in Minnesota Rules Chapter 7854. In accordance with Minnesota Rule 7854.0500 Subp.2., a site permit may not be issued until the certificate of need or other commitment requirement has been satisfied.

Site Permit Application, Preliminary Determination and Draft Site Permit
On August 22, 2008, WPL filed a revised site permit application with the PUC. On September 11, 2008, the PUC considered acceptance of the Site Permit application and made a preliminary determination to issue a draft site permit. On September 19, 2008, an Order accepted the application and issued a draft site permit. Upon acceptance of the application OES EFP staff initiated the review and notice requirements of Minnesota Rules Chapter 7854. See Attachment 2 in the Commissioner's packet.

Public Participation Process
The rules provide opportunities for the public to participate in deliberations on the LWECS site permit application. The public was advised of the submission of the site permit application after the application was accepted. OES EFP staff held a public information and scoping meeting in Albert Lea and Hartland on October 21, 2008, to provide the public with an overview of the permitting process for LWECS and to receive comments from the public on the site permit application, draft site permit and issues to be addressed in the Environmental Report. The meeting also provided the public with an opportunity to ask questions of the applicant and express concerns or issues directly to WPL. About 70 people attended the two public meetings.

OES staff provided an overview of the requirements of the permitting process and the conditions in the draft site permit and responded to questions about the permitting process and conditions in the draft site permit. Representatives of the applicant were available to describe the project and answer questions. Comments made and questions asked covered a broad spectrum of topics relating to wind energy. These included many positions, statements and comments about the need for the project, who pays for it, how does it benefit Minnesota, transmission requirements, setbacks, taxes, effects on wildlife, noise, property values and stray voltage.

Public Comments
Twenty-eight written comments were received, including 25 in a form-letter format. These 25 letters questioned the adequacy of residential setbacks, requested a set back of one mile from non-participating landowner's property lines and requested, if necessary, a contested case hearing for the presentation of documents that substantiate this request.

The other three comment letters were from two state agencies (Department of Natural Resources and Minnesota Department of Transportation) and the applicant.

Generally, the 25 written comment letters followed a form-letter format which read as follows:

> I, along with a group of concerned residents of Freeborn County, Minnesota, believe that the residential setback requirements for turbine placement, as proposed in the draft site permit, are inadequate and unsafe. I am supported in this view by numerous engineers, doctors, audiologists, health and safety organizations, and governments in both the United States and abroad.

> The setback requirements contained in the current proposal will negatively impact the health and safety of my family and my neighbors. Because of this, I am demanding that should a permit be issued for this project, it must include a minimum of a 1 mile setback from non-participating landowner's property lines.
>
> Should it be necessary to request a contested case hearing for the presentation of documents that substantiate this request, you may consider this letter as such. My neighbors and I would welcome any opportunities to present this information.

The letters from commenters stated that the proposed site permit conditions regarding some of the setbacks are "inadequate and unsafe and requested a minimum setback of one mile from non-participating landowner's property lines." The stated request for a contested case hearing, they say, would allow "for the presentation of documents that substantiate this request…"

On March 24, 2009, the Commission denied the request for a contested case hearing on WPL's site permit application; however, the Order required a public hearing on issues relating to siting and permitting to be held in conjunction with the public hearing that it had previously ordered for WPL's CON application.

A public hearing was held in Albert Lea on June 29, 2009. Administrative Law Judge (ALJ), Steve M. Mihalchick presided at the public hearing and was asked to prepare a summary of public testimony presented at the hearing. The ALJ's summary of public testimony and exhibit list was filed with the Commission on August 25, 2009 and filed with the eDocket system.

OES EFP Staff Comments and Analysis

EFP staff has reviewed the "Summary of Public Testimony" and exhibits introduced into the record of this proceeding. The following EFP staff comments and analysis address several concerns or comments in the ALJ' Summary of Public Testimony.

Bernard Hagen
Mr. Hagen indicated that he had developed tinnitus, or ringing in his ears while in the Army. Mr. Hagen stated that his doctor told him that living in close proximity to a wind turbine would aggravate his tinnitus and adversely affect his health and submitted a letter from his doctor.

OES EFP Response: WPL is not proposing to place any wind turbines on Mr. Hagen's property. According to a map provided by WPL the closest turbine to the Hagen property is more than 1,500 feet away from Mr. Hagen's property line and the second closest turbine is nearly 1,700 feet from the Hagen property. Other turbines in the area are further away.

Shadow Flicker--Carol Overland, Kristine Johnson
Ms. Overland questioned WPL about "shadow flicker" from wind turbines and sought assurances that if residences are in the "zone of impact" for flicker, that the company will consider alternative turbine locations. Ms. Overland seemed to indicate that shadow flicker is not noticeable beyond about ten rotor diameters.

OES EFP Response: Shadow flicker is described as "a moving shadow on the ground resulting in alternating changes in light intensity." Shadow flicker computer models simulate the path of the sun over the year and assess at regular time intervals the possible shallow flicker across a project area. The outputs of the model are useful in the design phase of a wind plant. Other than within approximately two rotor diameters from the base of a turbine, shadow flicker usually occurs in the morning and evening hours when the sun is low in the horizon and the shadows are elongated. Shadow flicker does not occur when the turbine rotor is oriented parallel to the receptor, or when the turbine is not operating. In addition, no shadow flicker will be present when the sun seen from a receptor is obscured by clouds, fog, or other obstacles already casting a shadow such as buildings and trees.

Shadow intensity, or how "light" or "dark" a shadow appears at a specific receptor, will vary with the distance from the turbine. Closer to a turbine, the blades will block out a larger portion of the sun's rays and shadows will be wider and darker. Receptors located farther away from a turbine will experience much thinner and less distinct shadows since the blades will not block out as much sunlight. Shadow flicker will be greatly reduced or eliminated within a residence when buildings, trees, blinds or curtains are located between the turbine and receptor. Shadow flicker consultants generally agree that flicker is not noticeable beyond about 10 rotor diameters from a wind turbine. Evidence of flicker effects is hard to find, it is more of a nuisance issue. There are no published standards for shadow flicker and no examples of turbines causing photosensitivity related problems. In Germany, 30 hours of shadow flicker per year is acceptable. The 30 hour number is based on the premise that the sun is shining, the building affected is occupied, the occupants are awake and the turbine is operating. The proposed site permit does not address shadow flicker limits. However, WPL has considered shadow flicker in its design layout.

Health Effects—Katie Troe, Cheryl Hagen, Carol Overland, Amy Wasson, Jason Jacobusse, Kristine Johnson and others
The persons identified above and others expressed concerns about sound or noise from the wind turbines, the potential for health effects from exposure to low frequency noise. Many of these questions were the basis of the request for a contested case hearing in this proceeding. A considerable portion of the ALJ's Summary of Public Testimony is devoted to comments related to health effects and the reader should refer to that document for the ALJ's summary of those issues.

OES EFP Response: During the time allowed for comments on the draft permit and scoping for the environmental report the public expressed numerous concerns about possible health effects of low frequency vibrations and sound from wind turbines. In late February 2009, OES requested a "white paper" from the Minnesota Department of Health (MDH) evaluating possible health effects associated with low frequency noise vibrations and sounds arising from large wind

energy conversion system (LWECS). A commenter on another wind project, the Lakeswind Wind Power Plant, in Clay, Becker and Ottertail counties (Docket No. IP6603/WS-08-1449), also wrote to the Commissioner of MDH to ask for an evaluation of health issues related to exposure to low frequency sound energy generated by wind turbines. In March 2009, MDH agreed to evaluate health impacts from wind turbine noise and low frequency vibrations. The MDH released its "white paper" on the "Public Health Impacts of Wind Turbines on May 22, 2009, and it was included in the Environmental Report (Appendix D), and submitted for the Certificate of Need (CON) proceeding for the Bent Tree Wind Project (Docket No. T-6657/CN-07-1425) (HE 4, Appendix D).

The summary of public testimony prepared by the ALJ captures the on-going concerns being expressed by some residents of the Project Area and their requests for turbine setbacks of one-half mile or more from homes.

In a letter to Mr. and Ms. Anderson, (OES Exhibit 12) dated August 13, 2009, MDH Commissioner, Sanne Magnan, M.D., Ph.D, responded to specific questions posed by Mr. Anderson as follows:

> *Are current standards in Minnesota safe?* Regulatory standards protect health and safety, but whether for air, water or noise, regulators do not set "bright line" standards without also considering cost, technical difficulties, possible benefit and alternatives. No regulatory standard offers absolute safety. The Minnesota Department of Health can evaluate health impacts, but it is the purview of regulatory agencies to weigh these impacts against alternative and possible benefits.
>
> *Are the proponents of wind turbine syndrome mistaken?* As noted in the "White Paper," the evidence for wind turbine syndrome, a constellation of symptoms postulated as mediated by the vestibular system, is scant. Further, as also noted, there is evidence that the symptoms do not occur in the absence of perceived noise and vibration. The reported symptoms may or may not be caused by "discordant" stimulation of the vestibular system.
>
> *Does more study of adverse effects need to be undertaken?* More study may answer questions about the actual prevalence of unpleasant symptoms and adverse effect under various conditions such as distance to wind turbines and distribution of economic benefit. However, there is at present enough information to determine the need for better assessment of wind turbine noise, especially at low frequencies. Such assessments will likely be beneficial for minimizing impacts when projects are sited and designed. Also, even without further research, there is evidence that community acceptance of projects, including agreement about

compensation of individuals within project areas, will result in fewer complaints. Therefore, more research would be useful, but the need will have to be balanced against other research needs.

WPL has evaluated both noise and shadow flicker during the planning stages of the Bent Tree Wind Project Phase I and II to make informed decisions about turbine placement. The permit (III.E.3.) requires the Permittee to comply with noise standards established by the Minnesota Pollution Control Agency.

The proposed site permit (III.F.2.) requires the Permittee to submit a proposal to the Commission for the conduct of a noise study.

Setbacks and Permit Conditions—Overland, Wasson, Jacobusse, Troe, Pfeffer, Johnson and Others

Many of the above commenter's expressed the need for setbacks from homes and property lines of at least 1,500 feet or more to account for noise, shadow flicker, health concerns and other general concerns (visual, lower property values).

OES EFP Response: The LWECS site permit contains a number mitigation measures, setback requirements, preconstruction survey requirements, site layout restrictions and other numerous requirements that provide for environmental protection and public health and safety. In addition to the site permit, the Permittee must obtain a number of other permits from federal, state and local units of governments after the site permit issues. Those permits are identified in the site permit application. Typically, the LWECS site permit does not specify individual turbine locations, because of numerous other details that must be planned and coordinated, including working with downstream permitting authorities and landowners. At the pre-construction meeting or prior to, the Permittee must demonstrate compliance with the conditions in the site permit for setbacks and site layout restrictions. The site permit also establishes the parameters for project design and implementation. If for example, turbines or associated facilities are located in prairie, a native prairie mitigation plan is required. Environmental monitoring or studies may also be implemented or required if warranted, based on results of post-permit issuance detailed site evaluations of potential turbine locations. For example, a noise study is being recommended for this Project.

The turbines and associated facilities will be placed on the properties of persons who have leased their wind and land rights to the WPL for the proposed Bent Tree Wind Project Phase I and Phase II. Non-participants who have not leased land or wind rights to WPL will not have turbines or associated facilities on their properties. In addition the wind turbines will be set back from the property lines of non-participating by a minimum 1,345 feet on the prevailing wind axis and 807 feet on the non-prevailing wind axis. WPL has stipulated that all turbines will be 1,000 feet or more from homes. (HE 28, p. 7). WPL will also comply with Minnesota's noise standards.

In summary, there are numerous site permit requirements that protect natural resource features as well as public health and safety. Minnesota has close to two thousand megawatts of operating wind energy facilities in place. Prior to July of 2005 those facilities were permitted by the

Minnesota Environmental Quality Board. Since July 2005, LWECS have been permitted by the Minnesota Public Utilities Commission. Many of the permit conditions in this proposed site permit have been LWECS site permit conditions since 1995. In the past 14 years, wind farm participants in Minnesota have not filed any public health or safety concerns with the EQB or the Commission, the responsible governmental unit; nor have comprehensive avian and bat studies demonstrated significant fatality or mortality impacts.

Minnesota Department of Natural Resources Comment Letter
On June 29, 2009, the DNR submitted letter to the ALJ recommending a two year post construction mortality study using DNR Protocols to monitor bird and bat mortality at Large Wind Energy Conversion Systems. (HE 2).

OES EFP Response: OES EFP staff does not believe that the record at this time supports monitoring requirements beyond those typically required for LWECS projects in Minnesota (Draft Permit at III.H.3, "Extraordinary Events").

As a requirement of the first permit issued for an LWECS in 1995, Northern States Power Company (NSP) was required to conduct an avian study to determine the effect of the turbines on avian mortality. An additional two-year study was required to determine the effect of the turbines on bats. Wind developers were required to compensate NSP for these studies, allowing the financial burden to be split among potentially affected parties, rather than borne by one party. Since that permit, post-construction surveys have not been a requirement of any individual permit.

With the continuing growth of wind energy in Minnesota, particularly outside of the Buffalo Ridge region of Southwest Minnesota, OES EFP staff suggests taking the time necessary to make a broader assessment of proposals for the conduct of avian studies. DNR, PUC, and OES EFP staffs currently are reviewing and discussing this topic. OES EFP staff also believes a comprehensive approach to addressing avian issues may be more useful and beneficial than project specific studies.

Amy Wasson
Amy Wasson (HE 21) offered specific suggestions to the language of the Conditions of the Site Permit as proposed in Section III of the Draft Permit.

OES EFP Response: The suggestions offered were reviewed by EFP staff and three of the suggestions or variations there of are incorporated into the proposed Site Permit (See Permit III.G.2., K.2., and F.2.) Others were reviewed and dismissed, either because they are already being done, such as placing compliance documents on eDockets, or they did not clarify existing permit language.

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The OES EFP staff believes the record in this matter is sufficiently robust to allow the Commission to make a decision on the permit application. OES EFP also believes the proposed site permit provides sufficient measures to provide necessary guidance regarding project design, construction, restoration, monitoring and operation of the proposed Bent Tree Wind Project Phase I and II.

Standard for Permit Issuance

The test for issuing a site permit for a Large Wind Energy Conversion System is to determine whether a project is compatible with environmental preservation, sustainable development, and the efficient use of resources. Minnesota Statutes Chapter 216F. The wind statutes incorporate certain portions of the Power Plant Siting Act, including the environmental considerations. Minnesota Rule 7849.5900. Also, the law allows the PUC to place conditions in LWECS permits. Minnesota Statutes 216F.04 (d).

Based on the record of this proceeding, DOC EFP staff concludes that the Bent Tree Wind Project Phase I and Phase II meets the procedural requirements and the criteria and standards for issuance of a site permit identified in Minnesota Statutes and Rules. The site permit application has been reviewed pursuant to the requirement of Minnesota Rules Chapter 7854 (Wind Siting Rules).

In accordance with Minnesota Rule 7854.0500 Subp.2, the Commission may not issue a site permit for an LWECS, for which a certificate of need is required, until an applicant obtains such a certificate from the Commission. WPL has applied to the Commission for a certificate of need for Phase I of the Bent Tree Wind Project (CN-07-1425). WPL has not, to date, sought a certificate of need for Phase II of the project. Accordingly, OES, EFP staff recommends adoption of findings of fact and conclusion of law for the project (Phase I and II), issuance of a site permit for Phase I of the project, and withholding a site permit for Phase II of the project until such time as WPL obtains a certificate of need for Phase II.

OES EFP staff has prepared for Commission consideration proposed Findings of Fact, Conclusions and Order, Exhibit List for the Bent Tree Wind Project Phase I and II, and a proposed Site Permit for the Bent Tree Wind Project Phase I, for 201.3 MW of the 400 MW Bent Tree Wind Project.

The site criteria addressed in the Findings of Fact (such as human settlement, public health and safety, noise, recreational resources, community benefits, effects on land based economies, archaeological and historical resources, animals and wildlife and surface water) track the factors described in the PUC's rules for other types of power plants that are pertinent to wind projects. The conditions in this proposed Site Permit are essentially the same as conditions included in other LWECS site permits issued by the Environmental Quality Board and the Commission.

A number of issues were identified during the course of this proceeding and they were summarized above in "*Public Comments*'' and the ALJ's "Summary of Public Testimony" submitted on August 25, 2009 and discussed in "*OES EFP Staff Comments and Analysis.*"

Proposed Findings of Fact

The proposed Findings (see Attachment 3 in the Commissioner's packet) address the procedural aspects the process followed, describe the project, and address the environmental and other considerations of the project. The proposed Findings of Fact reflect some findings that were also made for other LWECS projects. The following outline identifies the categories of the Findings of Fact.

Category	Findings
Background and Procedure	1 – 13
The Permittee	14
Project Description	15 – 23
Site Location and Characteristics	24 – 27
Wind Resource Considerations	28 – 30
Land Rights and Easement Agreements	31 – 33
Site Criteria	34 – 86
Site Permit Conditions	87 – 89

Exhibit List
OES EFP staff has prepared an exhibit list of documents that are part of the record in this permit proceeding, but not covered by the ALJ's Hearing Exhibit List; it is included as Attachment 4 in Commissioner's packet. OES EFP exhibits are listed by "OES Exhibit," followed by a number. ALJ Hearing Exhibits are listed as "HE," followed by a number (i.e. HE 1) and listed as a relevant document.

Proposed Site Permit
The OES EFP Staff has prepared a site permit for the Commission's consideration. See Attachment 5 in the Commissioner's packet.

Commission Decision Options

A. Bent Tree Wind Project Findings of Fact and Conclusions

1. Adopt the attached Findings of Fact, Conclusions of Law and Order prepared for the 400 MW Bent Tree Wind Project Phase I and Phase II in Freeborn County.

2. Amend the Findings of Fact and Conclusions of Law as deemed appropriate.

3. Make some other decision deemed more appropriate.

B. LWECS Site Permit for the 201.3 MW (Phase 1) Bent Tree Wind Project

1. Issue the proposed LWECS Site Permit for the 201.3 MW Bent Tree Wind Project Phase I to Wisconsin Power and Light Company.

2. Amend the proposed LWECS Site Permit as deemed appropriate.

3. Deny the LWECS Site Permit.

4. Make some other decision deemed more appropriate.

C. LWECS Site Permit for the Bent Tree Wind Project Phase II

1. Withhold issuance of a LWECS Site Permit for the Bent Tree Wind Project Phase II until such time as Wisconsin Power and Light Company or the entity purchasing the energy or owning the facility can satisfy the requirements of Minnesota Statutes 216B.243, subd 2 and Minnesota Rules 7849. Upon satisfying those requirements the Commission will reconsider LWECS Site Permit Issuance for the Bent Tree Wind Project Phase II.

2. Require the applicant to re-file its application pursuant to the requirements of Minnesota Rules 7854.

3. Make some other decision deemed more appropriate.

OES EFP Staff Recommendation: The staff recommends Options A1, B1 and C1.